UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,480	09/15/2005	Masahiro Yamakawa	4670-0110PUS1	8164

2292 7590 04/09/2008
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
REDDY, KARUNA P	

ART UNIT	PAPER NUMBER
1796	

NOTIFICATION DATE	DELIVERY MODE
04/09/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/549,480	YAMAKAWA ET AL.	
	Examiner	Art Unit	
	KARUNA P. REDDY	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/31/2008 has been entered.

   Applicants amended claim 1 and added claims 12-13. Claims 1-13 are currently pending in the application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined

application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Omum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-12 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8, and 12-17 of U.S. Patent No. 6, 656, 633 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because both are directed to electric double layer capacitor containing an electrode comprising a binder composition which is

substantially similar to that of the present claims. It is noted that examples of lithium ion secondary batteries include electric double layer capacitor (column 1, lines 17-22).

US Patent No. 6, 656, 633 B2 is silent with respect to the T_g of binder polymer.

However, Applicants attention is drawn to MPEP 804 where it is disclosed that those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious variation of an invention claimed in the patent. (underlining added by examiner for emphasis) *In re Vogel*, 422 F.2d 438,164 USPQ 619,622 (CCPA 1970).

Consistent with the above underlined portion of the MPEP citation, attention is drawn to example 2 which comprises monomers in the wt% of present claims. Given that the binder polymer comprises substantially similar monomers in the wt% of present claims, one of ordinary skill in the art would have a reasonable basis to believe that the binder composition of prior art exhibits essentially the similar T_g. Since PTO cannot conduct experiments, the burden of proof is shifted to the applicants to establish an unobviousness difference. See In re Fitzgerald, 619 F.2d 67, 205 USPQ 594 (CCPA 1980).

Even if properties of the binder of instant claims and examples in US Patent No. 6, 656, 633 B2 are not the same, it would still have been obvious to one of ordinary skill in the art to make binder having the claimed properties

because it appears that the references generically embrace the claimed binder and the person of ordinary skill in the art would have expected all embodiments of the reference to work. Applicants have not demonstrated that the differences, if any, between the claimed binder and the binder of prior art give rise to unexpected results.

5. Claims 1-12 are directed to an invention not patentably distinct from claims 1-8 and 12-17 of commonly assigned US Patent 6, 656, 633 B2. Specifically, see the discussion set forth in paragraph 3 above.

The U.S. Patent and Trademark Office normally will not institute an interference between applications or a patent and an application of common ownership (see MPEP Chapter 2300). Commonly assigned US Patent 6, 656, 633 B2, discussed above, would form the basis for a rejection of the noted claims under 35 U.S.C. 103(a) if the commonly assigned case qualifies as prior art under 35 U.S.C. 102(e), (f) or (g) and the conflicting inventions were not commonly owned at the time the invention in this application was made. In order for the examiner to resolve this issue, the assignee can, under 35 U.S.C. 103(c) and 37 CFR 1.78(c), either show that the conflicting inventions were commonly owned at the time the invention in this application was made, or name the prior inventor of the conflicting subject matter.

A showing that the inventions were commonly owned at the time the invention in this application was made will preclude a rejection under 35 U.S.C.

103(a) based upon the commonly assigned case as a reference under 35 U.S.C. 102(f) or (g), or 35 U.S.C. 102(e) for applications pending on or after December 10, 2004.

6. Claims 1-11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 and 6-10 of copending Application No. 10/567, 119. Although the conflicting claims are not identical, they are not patentably distinct from each other because both are directed to a electric double layer capacitor electrode comprising a binder composition which is substantially similar to that of the present claims.

Claims of copending application are silent with respect to polyfunctional (meth)acrylates.

However, in the general disclosure of copending application, mention is made of use of polyfunctional ethylenically unsaturated compounds such as diethylene glycol dimethacrylate. When these are copolymerized, the copolymer can be restrained from being dissolved or swelled with an electrolytic solution. The amount of polyfunctional ethylenically unsaturated monomers is usually 5% or less by weight (paragraph 0030). Therefore, it would have been obvious to use polyfunctional ethylenically unsaturated monomers in the binder polymer, for the above mentioned advantages.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 13 is directed to an electric double layer capacitor comprising an electrode containing binder composition comprising water and monomers. There is no support for an electric double layer capacitor comprising an electrode containing a binder composition comprising water and monomers as such. It is noted that specification at page 3 and elsewhere supports a binder composition containing binder polymer and water.

Claim Rejections - 35 USC § 102/103

9. Claims 1-4 and 6-13 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamakawa et al (US 6,656,633 B2).

Yamakawa et al disclose a polymer binder for electrode comprising a) structural units derived from monofunctional ethylenically unsaturated carboxylic acid ester monomer - e.g. 2-ethylhexyl acrylate, n-butyl acrylate (column 4, lines 4-6); b) structural units derived from an ethylenically unsaturated carboxylic acid monomer - e.g. acrylic acid, methacrylic acid (column 4, lines 43-46) and c) structural units derived from a methacrylonitrile monomer – e.g. methacrylonitrile (column 4, line 54). The binder exhibits enhanced electrochemical stability and is useful for making an electrode of a lithium ion secondary battery (abstract). Lithium ion secondary batteries include electric double layer capacitor (column 1, lines 17-22). The polymer preferably further comprises d) structural units derived from a polyfunctional ethylenically unsaturated carboxylic acid monomer - e.g. ethylene glycol dimethacrylate (column 4, lines 60-67) and polyalkylene glycol dimethacrylates (column 5, lines 5-14). The mass percentages of components a-d in examples 1 and 2 of prior art are essentially similar to parts by mass of examples 1 to 4 in table 1 of instant invention and read on the mole percentages of present claims. The liquid medium for the preparation of the binder composition can be either water or an organic liquid substance (column 7, lines 39-41). The polymer particles have a volume average particle diameter in the

range of 0.001 to 500 μm and overlaps with the particle size of claim 3 (column 6, lines 63-65).

The slurry comprises binder, active material and optional additives (column 8, lines 37-39). As specific examples of the active material there can be mentioned carbonaceous material (column 8, lines 53-54) that reads on claim 4. Further, electrically conductive materials including carbon such as graphite and active carbon can be incorporated in the slurry (column 9, lines 19-22). Additives such as a viscosity modifier and a fluidizing agent can be added in the binder composition to improve properties of the slurry. As specific examples of the additives mention can be made of cellulose materials such as carboxymethyl cellulose (column 8, lines 11-17) and reads on the thickener of claim 6. The electrode is fabricated by a procedure wherein a collector such as metal foil is coated with the slurry and thus formed coating is dried (column 9, lines 29-32). A metal foil such as aluminum foil is coated with slurry and the formed coating is air dried at 120^0C (column 10, lines 66-67; column 11, line 1) and overlaps with the drying temperature of claim 8. A battery is fabricated by using circular positive electrode or negative electrode, a lithium metal counter electrode and a separator, which is sandwiched between the positive electrode or negative electrode and a lithium metal counter electrode. An assembly of the two electrodes and separator is placed in a coin shaped outer casing. An electrolyte solution is injected into the casing and fabricated assembly is covered with a

stainless steel cap (column 12, lines 8-31). The fabricated assembly reads on the electric double layer capacitor of claims 11 and 13.

Yamakawa et al is silent with respect to glass transition temperature of the binder polymer.

However, in light of the fact that prior art teaches / discloses essentially the same binder polymer as that of the claimed, one of ordinary skill in the art would have a reasonable basis to believe that the presently claimed binder polymer must inherently have the same properties. Since PTO cannot conduct experiments, the burden of proof is shifted to the applicants to establish an unobviousness difference. See In re Fitzgerald, 619 F.2d 67, 205 USPQ 594 (CCPA 1980).

Even if properties of the binder of instant claims and prior art examples are not the same, it would still have been obvious to one of ordinary skill in the art to make binder having the claimed properties because it appears that the references generically embrace the claimed binder and the person of ordinary skill in the art would have expected all embodiments of the reference to work. Applicants have not demonstrated that the differences, if any, between the claimed binder and the binder of prior art give rise to unexpected results.

Claim Rejections - 35 USC § 103

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakawa et al (US 6,656,633 B2) as applied to claims 1-4 and 6-11 above, and further in view of Kasuke (JP 08-107047).

The discussion with respect to Yamakawa et al in paragraph 9 above is incorporated herein by reference.

Yamakawa et al is silent with respect to carbonaceous material comprising active carbon having a specific surface area of 30 m^2 or more.

However, Kasuke teaches an electric double layer capacitor where in the specific surface area of an active carbon material used as an anode and cathode is specified as 1000 m^2/g to 2500 m^2/g and 500 m^2/g to 1500 m^2/g respectively. These surface areas are specified to improve the capacitor output capacity (abstract). Therefore, it would have been obvious to one skilled in the art at the time invention was made to use carbonaceous material comprising active carbon having surface area between 500 to 2500 m^2/g in the binder composition of Yamakawa et al, because it has been proven successfully by Kasuke and one of ordinary skill in the art would have expected the specified surface area of 500 to 2500 m^2/g to result in improvement of capacitor output capacity, motivated by expectation of success.

Response to Arguments

11. Applicant's arguments filed 11/1/2007 have been fully considered but they are not persuasive. Specifically, applicant argues that (A) lithium ion secondary battery is different from electric double layer capacitor; (B) Yamakawa '633 does not teach or suggest the claimed method of producing an "electrode for an electric double layer capacitor". Statements in the preamble, of claims 7-8, reciting the purpose or intended use must be evaluated during examination; (C) in Yamakawa '633 multifunctional ethylenically unsaturated carboxylic acid ester is not required. Thus, in data no. 2, multifunctional ethylenically unsaturated carboxylic ester is substituted by ethylenically unsaturated carboxylic acid which Yamakawa '633 considers as an essential component; (D) binder of present invention shows unexpected results with respect to swelling ratio and can rebut prima facie obviousness; (E) present claims are amended to specifically recite "dimethacrylates, trimethacrylates, diacrylates and triacrylates". Thus, the comparative runs done are commensurate with scope of present claims.

With respect to (A), it is noted that examples of lithium ion secondary batteries, in the prior art, include electric double layer capacitor (column 1, lines 17-22).

With respect to (B), Yamakawa et al '633 teach that electric double layer capacitor is a type of lithium ion secondary battery and is thus anticipated by the prior art of Yamakawa et al. In addition, process steps used to make the electrode are essentially the same.

With respect to (C) and (D), see example 2 of Yamakawa et al '633, wherein the binder polymer, in recited percentages, comprises all components that are required in the present claims i.e. a) 84 parts of 2-ethylhexyl acrylate, b) 10 parts of methacrylonitrile, c) 2 parts of ethylene glycol dimethacrylate, and d) 2 parts of methacrylic acid. It is noted that the present claims are anticipated by or alternatively obvious over Yamakawa et al '633. While the obviousness rejection can be overcome by a showing of unexpected results, it cannot overcome anticipatory rejection. In addition, comparative studies should include side-by-side runs with the closest prior art example i.e. example 2.

With respect to (E), amended claims include tri(meth)acrylates as well as di(meth)acrylates while the comparative runs include only dimethacrylates and thus are not commensurate in scope with the present claims.

12. It is noted that, declaration submitted, on 1/31/2008, under 37 CFR 1.1.32 is not relevant to the present claims and appears to be directed to a different application with serial number 10/567,257. Examiner notified applicant, on 3/14/2008, of inapplicability of the declaration submitted.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARUNA P. REDDY whose telephone number is (571)272-6566.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Karuna P Reddy/
Examiner, Art Unit 1796

/VASUDEVAN S. JAGANNATHAN/
Supervisory Patent Examiner, Art Unit 1796